

# **Transfer of Probabilistic Winter Weather Products from WPC Test Bed to Operations**

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## **Abstract**

The Hydrometeorology Test Bed (HMT) at the Weather Prediction Center (WPC) has completed extensive testing of multiple probabilistic methodologies for winter weather, and delivered the forecast products and techniques to WPC operations. In the medium range period, the WPC-HMT evaluated a probabilistic Day 4-7 winter weather outlook methodology for two years and recommended improvements, which included the use of a multi-ensemble approach to the quantitative precipitation forecast (QPF) and precipitation type components of the forecast, as well as forecast threshold probabilities. The Day 4-7 winter weather outlook is prepared by WPC medium range forecasts twice daily, and during the 2014-15 winter season, was disseminated to National Weather Service Forecast Office (WFO) forecasters for evaluation. Favorable reviews by WFO forecasters, feedback provided by the 2015 Winter Weather Experiment (WWE), and WPC objective verification, all pointed to product improvement. This improvement gave WPC the confidence to proceed with issuing the outlook as a public experimental product across the weather enterprise during the 2015-16 winter season. Several WFOs are utilizing the Day 4-7 outlook to draft local probabilistic winter weather products for their respective County Warning Areas (CWA). WPC-HMT has also extensively tested model implicit snowfall forecasts in recent WWE efforts using model microphysics to improve snowfall forecasts at WPC. The application of these microphysics parameters to the post processing of snowfall has been delivered as a multi-model blend methodology to apply a snow to liquid ratio (SLR) to the WPC snowfall forecast. This blended SLR is also disseminated to WFOs. Results from these successful transfers from test bed to operations will be presented.

Ongoing WPC-HMT work includes the evaluation of hourly snowfall rate parameterization from a beta test version of the National Center for Environmental Prediction (NCEP) NAM 3km NEST, and the Earth System Research Laboratory (ESRL) HRRR experimental model and ensemble system. This parameterization will be evaluated both deterministically and probabilistically in the 2016 Winter Weather Experiment at WPC. It uses a neighborhood ensemble approach to ascertain the utility of identifying heavy snowfall banding in the first 12-24 hours of the forecast. Snow and ice probabilistic guidance for WFO watch and warning threshold criteria will be evaluated in WWE 2016. This guidance is derived from WPC snowfall and probability of winter precipitation forecasts (PWPF), and is also used in the WPC Watch and Warning Collaboration tool. Probabilistic wind guidance using WFO surface wind forecasts and multi-ensemble 10-meter winds will also be part of this WWE experiment exercise to assess the predictability of multiple impact winter weather elements. Results from WWE 2016 as well as plans for the development of test bed activities for the Day 8-10 forecast period will be presented.